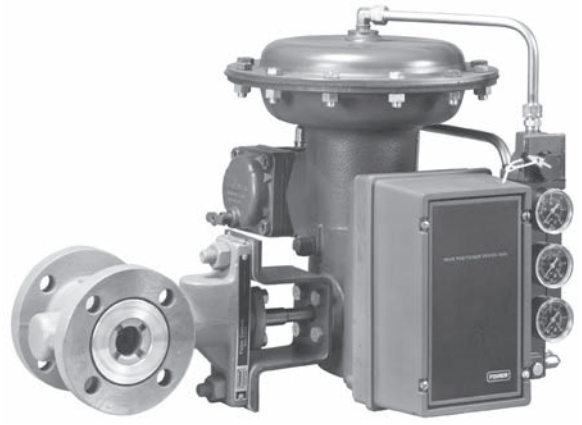
Fisher® 1052 Size 20 Diaphragm Rotary Actuator with F and G Mounting Adaptation

Contents

Introduction 1
Scope of manual 1
Description 1
Specifications 1
Principle of Operation 2
Installation 2
Mounting Procedure 3
Adjusting Spring Compression 5
Initial Compression 5
Stroking Range 6
Maintenance 6
Disassembly 7
Assembly 7
Changing Actuator Mounting 8
Top-Mounted Handwheel 9
Parts Ordering 10
Parts Kits 11
Parts List 11

Figure 1. Fisher 1052 Size 20 Actuator with Positioner



W5030

Introduction

Scope of Manual

This instruction manual includes installation, adjustment, operation, maintenance, and parts information for the 1052, size 20, Style F and G diaphragm rotary actuator (figure 1), and the optional top-mounted handwheel (figure 4). Instructions for the control valve, rotary positioners, and accessories are included in separate manuals.

Do not install, operate, or maintain a 1052 actuator without being fully trained and qualified in valve, actuator, and accessory installation, operation, and maintenance. To avoid personal injury or property damage, it is important to carefully read, understand, and follow all the contents of this manual, including all safety cautions and warnings. If you have any questions about these instructions, contact your Emerson Process Management sales office before proceeding.

Description

The spring-and-diaphragm actuator is used on small rotary shaft valves for throttling or on-off applications. It mounts to V150 Vee-Ball™ valves, V500 valves, eccentric disc valves, and butterfly valves with 3/8 inch and 1/2 inch splined shafts. The actuator accepts a 3610J, 3620J, or PMV positioner. A top-mounted handwheel is available for the unit.

Specifications

Specifications are shown in table 1 for 1052 Style F & G size 20 actuators. Some specifications for a given actuator, as it originally comes from the factory, are shown on the nameplate attached to the actuator.

Table 1. Specifications

Operating Principle

Direct Acting: Increasing loading pressure forces the diaphragm rod from the top to the bottom of the casing

Casing Pressure Ranges

■ 0 to 1.2 bar (0 to 18 psig), ■ 0 to 2.3 bar (0 to 33 psig), or ■ 0 to 2.8 bar (0 to 40 psig) depending on spring used

Maximum Allowable Sizing Pressure(1)

3.5 bar (50 psig)

Maximum Allowable Casing Pressure

4.1 bar (60 psig)

Maximum Rotation

90 degrees (travel is adjustable between 60 degrees and 90 degrees by travel stops)

Acceptable Valve Shaft Diameters, Inches

■ 9.5 mm (3/8 inch) or ■ 12.7 mm (1/2 inch)

Stroking Time

Depends on rotation, spring rate, initial spring compression, and supply pressure. If stroking time is critical, consult your Emerson Process Management sales office

Material Temperature Capabilities(1)

–40 to 82°C (–40 to +180°F)

Pressure Connections

1/4 NPT internal

Mounting Configurations

See figures 2 and 3

Approximate Weight

13.6 kg (30 lb)

Top-Mounted Handwheel Specifications

Operating Principle: Can be used for manual operation of the actuator or as an adjustable “up" travel stop
Diameter: 121 mm (6.75 inch)

1. Use this value to determine the maximum torque output. The pressure-temperature limits in this manual and any applicable code or standard should not be exceeded.

Principle of Operation

Key numbers refer to figure 5. The diaphragm rod (key 10) moves down as loading pressure is increased on top of the diaphragm (key 3). As the loading pressure is decreased, the spring (key 11) forces the diaphragm rod upward.

The spring and diaphragm are selected to meet the requirements of the application and, in service, the actuator should produce full travel of the valve with the diaphragm pressure as indicated on the nameplate.

Consult the positioner instruction manual for actuator principle of operation with positioner.

Installation

⚠ WARNING

Always wear protective gloves, clothing, and eyewear when performing any installation operations to avoid personal injury.

Personal injury or equipment damage caused by sudden release of pressure may result if the valve assembly is installed where service conditions could exceed the limits given in table 1 or on the appropriate nameplates. To avoid such injury or damage, provide a relief valve for over-pressure protection as required by government or accepted industry codes and good engineering practices.

Check with your process or safety engineer for any additional measures that must be taken to protect against process media.

If installing into an existing application, also refer to the WARNING at the beginning of the Maintenance section in this instruction manual.

CAUTION

To avoid parts damage, do not use an operating pressure that exceeds the Maximum Diaphragm Casing Pressure (table 1) or produces a torque greater than the Maximum Allowable Valve Shaft Torque (see Catalog 14). Use pressure-limiting or pressure-relieving devices to prevent the diaphragm casing pressure from exceeding its limit.

The actuator, as it comes from the factory, is normally mounted on a valve. Follow valve instructions when installing the control valve in the pipeline.

A 1/4 NPT pressure connection is located on top of the actuator. Run either 1/4 NPT pipe or 3/8 inch tubing between the pressure connection and the instrument. Keep the length of tubing or pipe as short as possible to avoid transmission lag in the control signal. If a valve positioner is used, the pressure connection to the actuator will normally be made at the factory.

When the control valve is completely installed and connected to the actuator, check it for correct action (air-to-open or air-to-close) to match the controlling instrument. For successful operation, the actuator stem and valve shaft must move freely in response to the loading pressure change on the diaphragm.

Use the following steps to connect a valve and an actuator that have been ordered separately. Because the procedures in the Mounting Procedure section require removal of initial spring compression, it is necessary to read the Spring Compression Adjustment section before completing the installation.

Mounting Procedure

This procedure assumes that the style ordered from the factory (A, B, C or D) was correct. Key numbers refer to figure 5.

1. Remove the positioner if one is used, and unscrew machine screws (key 40) to remove the positioner bracket or the cover (key 39).
2. Consult figure 2 for available mounting styles and positions. The actuator is normally mounted vertically with the valve in a horizontal pipe run.
3. Ensure all the initial spring compression has been removed from the spring. To relieve spring compression, insert a screwdriver blade between the notches at the base of the spring adjusting screw (key 74) as shown in figure 3. Push the tip of the screwdriver blade to the right. This rotates the spring adjusting screw counterclockwise. Continue until the stop is reached which occurs when the spring seat (key 13) is lowered to the adjusting screw base.
4. Before sliding the valve shaft into the lever, position the valve as follows:

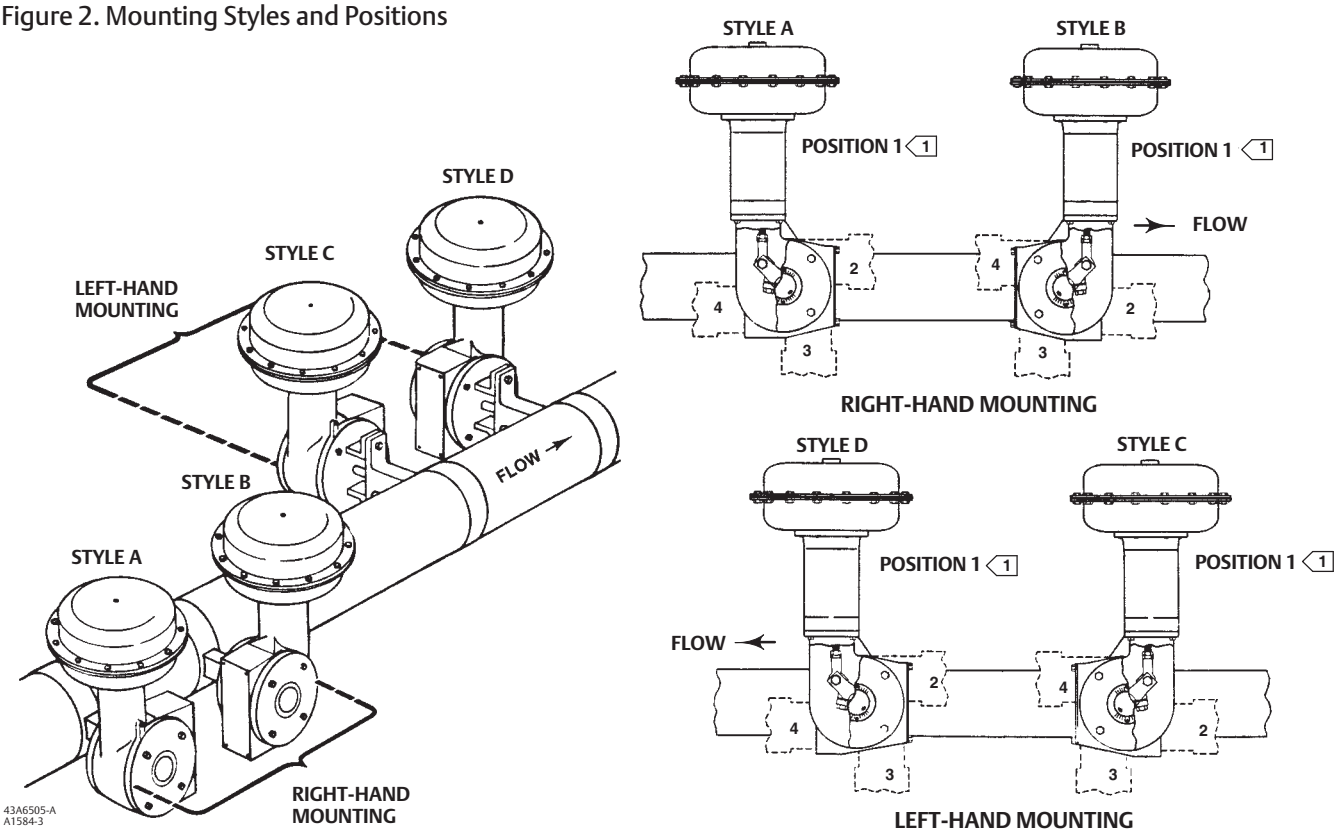
- For push-down-to-close action, the valve should be fully open.
- For push-down-to-open action, the valve should be fully closed (see the valve instruction manual).

5. Position the lever in the housing to align with the holes at each end of the housing. Compare the position of the lever to the position shown in figure 2. Notice that when the lever is in the correct position to receive the valve shaft, the ”down” travel stop is nearly vertical, as shown in figures 3 and 5.

MOUNTING	ACTION(1)	VALVE SERIES OR DESIGN				VALVE SERIES OR DESIGN		
		Ball/Plug Rotation To Close(3)	V250	V150, V200 & V300	CV500 V500	Disc/Ball Rotation to Close	V250	8510B, 8532, 8560 9500
Right-Hand	PDTC PDTO	CCW CCW	A B	A B	A B	CW CW	NA NA	B A
Left-Hand	PDTC PDTO	CCW CCW	NA NA	D C	D C	CW CW	C D	C D
Left-Hand (Optional)(2)	PDTC PDTO	CW CW	NA NA	C D	NA NA	NA NA	NA NA	NA NA

1. PDTC—Push-down-to-close, and PDTO—Push-down-to-open.
2. A left hand ball will be required for the NPS 3 through 12 Series B and the NPS 14 to 20, with or without attenuator.
3. CCW—Counterclockwise, and CW—Clockwise.

Figure 2. Mounting Styles and Positions

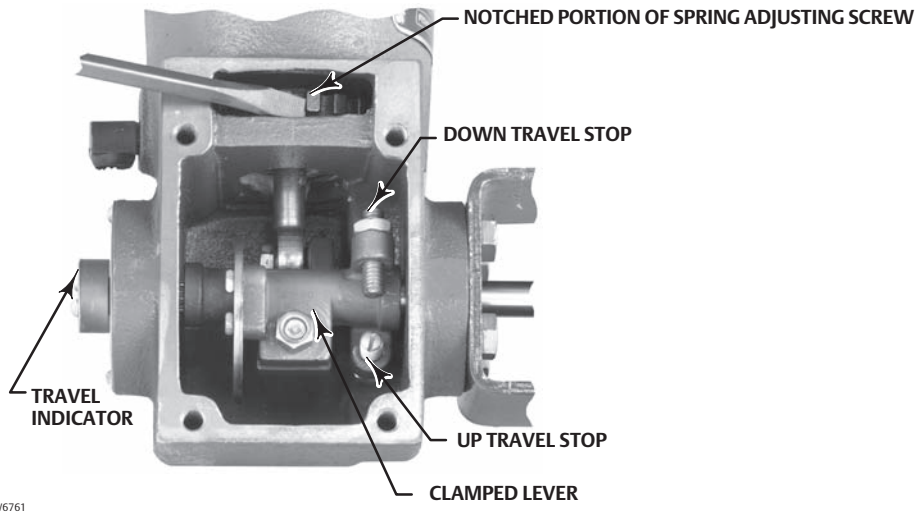


NOTES:
1 POSITION 1 IS STANDARD; POSITIONS 2 THROUGH 4 (SHOWN IN DOTTED LINES) ARE ALTERNATIVES.

6. Slide the valve shaft into the lever. Insert the lever in the opening. Tighten the valve mounting cap screws (see table 2).
7. Remove machine screws (key 36) and remove the hub (key 29) and the travel indicator scale (key 35).
8. Reposition the hub on the splined valve shaft so that the travel indicator screw holes align with the offset portion (where the rod end bearing connects) of the lever.
9. Loosen the hex nut (key 145) to allow the valve shaft to slide out of the clamped lever (key 27).
10. Center the lever in the opening. For newer clamping levers, torque the cap screw and nut (keys 28 and 145) to a torque listed in table 2.
11. With the hub positioned properly, the travel scale and indicator can show the correct position of the valve and point in the direction of flow when the valve is open. Replace the machine screws, fastening the travel indicator scale to the housing and the travel indicator to the hub.

12. Adjust the "up" travel stop (key 8) so that it touches the housing, and then lock the travel stop in position with the hex nut (key 86).

Figure 3. Spring Adjustment



⚠ WARNING

To avoid personal injury and equipment damage from moving parts within the actuator, keep fingers and tools away from the actuator when stroking the valve with the actuator cover removed.

13. Fully stroke the valve, and adjust the "down" travel stop so that it touches the housing. Then lock the travel stop in position with the hex nut (key 86).

Adjusting Spring Compression

Spring adjustment is shown in figure 3. Key numbers are shown in figure 5.

Initial Compression

CAUTION

To avoid adjustment error which could lead to possible product damage, comply with the following bench set adjustment procedure.

The 1052 nameplate specifies a Spring Initial Set, which is the initial compression adjusted into the actuator spring. Initial compression is the casing pressure at which the diaphragm (key 3) and diaphragm rod (key 10) begin to move away from the "up" travel stop. The initial compression was selected (based upon the service conditions specified when the actuator was ordered) so that when the actuator and valve are in service, the valve will seat properly and full travel will be obtained within a standard casing range of 0 to 1.2 bar (0 to 18 psig) or 0 to 2.3 bar (0 to 33 psig).

If the actuator has been disassembled or if the spring adjustment was changed, the initial compression may be adjusted to not exceed the Spring Initial Set value on the nameplate.

Proper bench set of the spring can only be made when the actuator "up" travel stop has been approximately adjusted. Insert a shaft in the actuator and adjust the "up" travel stop before establishing spring compression (since there is no travel stop in the upper diaphragm casing). Considerable error in adjustment is certain if the above procedure is not followed. This error can result in under travel of the actuator when the spring goes solid or excess spring compression has been applied.

Adjust the spring so that the diaphragm rod just starts to travel at the Spring Initial Set pressure specified on the nameplate. To adjust the spring, remove the positioner, if one is used, or the cover. The lower part of the spring adjusting screw is notched, as shown in figure 3. Using a screwdriver as shown in figure 3, rotate the notches to the right to decrease spring compression or to the left to increase spring compression. Replace the positioner or the cover.

Stroking Range

If, under operating conditions, the stroking range does not match the intended casing pressure, it may be possible to shift the stroking range by making a spring adjustment to change the initial spring compression. A spring adjustment will shift the casing pressure span and will equally increase (or decrease) the casing pressure at which the actuator begins to stroke and the pressure at which the actuator reaches full travel.

To adjust the spring, remove the positioner, if one is used, or the cover. The lower part of the spring adjusting screw is notched. Using a screwdriver as shown in figure 3, rotate the notches to the right to shift the casing pressure span downward, or to the left to shift the casing pressure span upward. Replace the positioner or the cover.

Maintenance

Actuator parts are subject to normal wear and must be inspected and replaced as necessary. The frequency of inspection and replacement depends upon the severity of service conditions. Instructions are given below for disassembly and assembly of parts. Key numbers are shown in figure 5, unless otherwise noted.

⚠ WARNING

Avoid personal injury or property damage from sudden release of process pressure or uncontrolled movement of parts. Before performing any maintenance operations:

- **Always wear protective gloves, clothing, and eyewear when performing any maintenance operations to avoid personal injury.**
- **Disconnect any operating lines providing air pressure, electric power, or a control signal to the actuator. Be sure the actuator cannot suddenly open or close the valve.**
- **Use bypass valves or completely shut off the process to isolate the valve from process pressure. Relieve process pressure from both sides of the valve. Drain the process media from both sides of the valve.**
- **Vent the power actuator loading pressure and relieve any actuator spring precompression.**
- **Use lock-out procedures to be sure that the above measures stay in effect while you are working on the equipment.**
- **The valve packing box may contain process fluids that are pressurized, *even when the valve has been removed from the pipeline.* Process fluids may spray out under pressure when removing the packing hardware or packing rings, or when loosening the packing box pipe plug.**
- **Check with your process or safety engineer for any additional measures that must be taken to protect against process media.**

Table 2. Recommended Bolting Torques

DESCRIPTION KEY NUMBER		TORQUE	
	Sizes	N•m	Lbf•ft
Casing Diaphragm 5/6	3/8-24	27	20
Diaphragm to rod 9	5/16-18	22	16
Rod end to lever 18	5/16-18	22	16
To Yoke 23	3/8-16	34	25
Travel Stop nut 86	5/16-18	27	20
Clamped lever 145/28	5/16-18	27	20

Disassembly

The following procedure describes how the actuator can be completely disassembled. When inspection or repairs are required, disassemble only those parts necessary to accomplish the job.

1. Isolate the operating equipment from its process. Release process pressure, vent all actuator loading pressure, and remove the tubing or pipe from the top of the actuator.
2. Remove positioner, if applicable, or remove the machine screws (key 40) and remove the cover (key 39).
3. Rotate the handwheel (if one is used) counterclockwise to be sure the handwheel is not compressing the spring (key 11).

⚠ WARNING

Be sure to relieve spring compression before loosening the diaphragm casing cap screws and nuts (keys 5 and 6). Personal injury can occur if spring compression forces the upper diaphragm casing (key 1) from the actuator.

4. To relieve spring compression, insert a screwdriver blade between the notches at the bottom of the spring adjusting screw (key 74) as shown in figure 3. Push the screwdriver tip to the right to rotate the adjusting screw until a stop is reached.
5. Loosen the hex nut (key 145) to allow the valve shaft to slide out of the clamped lever (key 27).
6. Remove the valve mounting cap screws. Slide the valve shaft out of the lever.
7. Unscrew and remove casing cap screws and nuts (keys 5 and 6). Remove the upper casing and the diaphragm (key 3).
8. Heat the cap screw (key 18) to 177°C (350°F) long enough for the medium strength thread-locking compound (key 77) to lose its holding strength. Then, remove the cap screw (key 18). This separates the actuator rod and rod end bearing from the lever.
9. Pull the diaphragm plate (key 4) and attached diaphragm rod out of the actuator. Remove the cap screw (key 9) to separate the diaphragm plate and diaphragm rod.
10. Remove the actuator spring (key 11) from the actuator, lift out the spring adjusting screw (key 74), the spring seat (key 13), and the thrust washer (key 71).
11. Check the condition of the bearing (key 31). If replacement of the bearing is necessary, the travel indicator (key 37) must first be removed by removing the machine screws (key 38). Then, the hub (key 29) and travel indicator scale (key 35) must be removed by removing the self-tapping screws or cap screws (key 36). Mark the orientation of the travel indicator scale with respect to the actuator housing before removing it.

Assembly

This procedure assumes that the actuator was completely disassembled. If not, start these instructions at the appropriate step. Key numbers are shown in figure 5. Use bolt torques in table 2. Before assembly, apply lithium grease to the threads of the spring adjusting screw (key 74), to the inside of the lever (key 27), and to the valve shaft.

1. Replace the bushing (key 31) if it was removed.
2. If the diaphragm rod/bearing assembly (key 10) was removed from the actuator and separated from each other, thread the rod into the bearing.
3. Bolt the rod end bearing to the lever (key 27) with cap screw (key 18). Coat the threads of the cap screw with medium strength thread-locking compound.
4. If necessary, assemble the lever using two travel stop studs (key 8) and locking nuts (key 86) for old and new style levers. Newer levers are clamped, and will also require that you install the cap screw (key 28) and thread the lock nut (key 145) in place, but do not tighten it at this time.
5. Place the lever, rod end bearing, and diaphragm rod into the actuator with the diaphragm rod inside the diaphragm housing (key 20).
6. Install the thrust washer (key 71), followed by the spring adjusting screw (key 74), the spring seat (key 13), and the spring (key 11) into the diaphragm housing.
7. Attach the diaphragm plate (key 4) to the diaphragm rod with cap screw (key 9) and washer (key 79). Apply lithium grease (key 76) to the portion of the rod that fits into the diaphragm plate.
8. Replace the diaphragm (key 3). Position the diaphragm casing (key 1) in place on the diaphragm housing (key 20). Secure the diaphragm casing with cap screws and nuts (keys 5 and 6). Ensure that the warning plate (key 56) is replaced on the casing.
9. Attach the valve to the actuator, and position the travel indicator as described in the Mounting Procedure section.
10. Adjust the initial spring compression as described in the Adjusting Spring Compression section.

Changing Actuator Mounting

The actuator is normally positioned vertically in a horizontal pipeline. However, each style can be mounted in four possible mounting styles and four possible positions. See figure 2.

⚠ WARNING

Avoid personal injury or property damage from sudden release of process pressure or uncontrolled movement of parts. Before performing any maintenance operations:

- **Always wear protective gloves, clothing and eyewear when performing any maintenance operations to avoid personal injury.**
- **Disconnect any operating lines providing air pressure, electric power, or a control signal to the actuator. Be sure the actuator cannot suddenly open or close the valve.**
- **Use bypass valves or completely shut off the process to isolate the valve from process pressure. Relieve process pressure from both sides of the valve. Drain the process media from both sides of the valve.**
- **Vent the power actuator loading pressure and relieve any actuator spring precompression.**
- **Use lock-out procedures to be sure that the above measures stay in effect while you are working on the equipment.**
- **The valve box may contain process fluids that are pressurized, *even when the valve has been removed from the pipeline.* Process fluids may spray out under pressure when removing the packing hardware or packing rings, or when loosening the packing box pipe plug.**
- **Check with your process or safety engineer for any additional measures that must be taken to protect against process media.**

Style A is right-hand mounted while style D is left-hand mounted. In all other ways the styles A and D are identical.

Style B is right-hand mounted while style C is left-hand mounted. In all other ways the styles B and C are identical.

Use the following procedure to convert from styles A and D to styles B and C (or vice versa) or to change the mounting position.

1. Follow steps 1 through 6 in the Disassembly portion of the Maintenance section.
2. If changing styles,
   a. Unscrew cap screws (key 23), and remove the actuator housing (key 20) from the mounting yoke (key 22).
   b. Rotate the housing 180 degrees, maintaining the appropriate position (1, 2, 3, 4), and place the actuator onto the mounting yoke.
3. If changing position, unscrew cap screw (key 23), and rotate the actuator housing to the desired position. Consult table 2 for appropriate bolt torques.
4. Secure actuator housing (key 20) to the mounting yoke (key 22) with cap screws (key 23). Consult table 2 for appropriate bolt torques.
5. Follow steps in the Mounting Procedure section to connect the actuator to the valve.
6. Adjust initial spring compression as described in the Adjusting Spring Compression section.

Top-Mounted Handwheel

Key numbers used in this section are shown in figure 4 except where indicated.

The optional top-mounted handwheel, shown in figure 4, can be used as a manual actuator or as an adjustable ”up” travel stop to limit full retraction of the diaphragm rod (key 10, figure 5).

The handwheel assembly is attached to a special upper diaphragm casing (key 1, figure 5) with cap screws (key 141). A hex nut (key 137) locks the handwheel in position.

Turning the handwheel (key 51) clockwise into the upper casing forces the pusher plate (key 135) against the diaphragm and diaphragm plate (keys 3 and 4, figure 5) to compress the spring (key 11, figure 5) and move the diaphragm rod downward. Turning the handwheel counterclockwise allows the actuator spring to move the diaphragm rod upward. If the valve is ”push-down-to-close”, full opening can be restricted by positioning the handwheel at the desired position. If the valve is ”push-down-to-open,” full closing of the valve can be restricted by using the handwheel.

Instructions are given below for complete disassembly and assembly required for inspection and parts replacement.

Disassembly

⚠ WARNING

To avoid personal injury from the precompressed spring force thrusting the upper diaphragm casing (key 1, figure 5) away from the actuator, relieve spring compression before diaphragm casing bolting is loosened.

1. Remove the upper diaphragm casing (key 1, figure 5) by following steps 1 through 5, and 7 of the Disassembly part of the Maintenance section.
2. Remove the cotter pin, hex nut, handwheel, and locknut (keys 247, 54, 51, and 137). Unscrew the stem (key 133) out through the actuator end of the handwheel body (key 142).

3. Remove cap screws (key 141), and separate the handwheel assembly from the upper casing.
4. Check the condition of the O-rings (keys 138 and 139); replace them if necessary.
5. If it is necessary to remove the pusher plate (key 135), drive out the groove pin (key 140).

Assembly

1. Before assembling the actuator, lubricate the thread of the stem (key 133) and the bearing surfaces of the stem and pusher plate (key 135) with lithium grease.
2. If the pusher plate was removed, re-attach it to the stem, and drive in a new groove pin (key 140).
3. Apply lithium grease (key 241) to the O-rings (keys 138 and 139). With the O-rings in place, thread the stem into the handwheel assembly.
4. Attach the handwheel assembly to the upper diaphragm casing (key 1, figure 5) with cap screws (key 141).
5. Re-install the locknut, handwheel, hex nut, and cotter pin (keys 137, 51, 54, and 247).
6. Re-install the diaphragm casing, making certain the warning tag is in place on the casing flange.
7. Tighten the cap screws (key 5, figure 5) evenly in a criss-cross pattern to the torque shown in table 2.
8. Adjust the initial spring compression as described in the Adjusting Spring Compression section.

Parts Ordering

Each actuator has a nameplate attached to the actuator housing and a serial number stamped on it. Always refer to this serial number when corresponding with your Emerson Process Management sales office regarding replacement parts or technical information.

⚠ WARNING

Use only genuine Fisher replacement parts. Components that are not supplied by Emerson Process Management should not, under any circumstances, be used in any Fisher valve, because they may void your warranty, might adversely affect the performance of the valve, and could cause personal injury and property damage.

Note

Neither Emerson, Emerson Process Management, nor any of their affiliated entities assumes responsibility for the selection, use, or maintenance of any product. Responsibility for the selection, use, and maintenance of any product remains with the purchaser and end user.

Parts Kits

--- Retrofit kit
Kit provides parts to add a top-mounted handwheel.
Kit number 1 includes the handwheel assembly only.
Kit number 2 includes kit number 1 and a new diaphragm casing (key 1) that is required to mount the new handwheel

Key	Description	Part Number
	Kit number 1	28A1205X012
	Kit number 2	28A1205X112

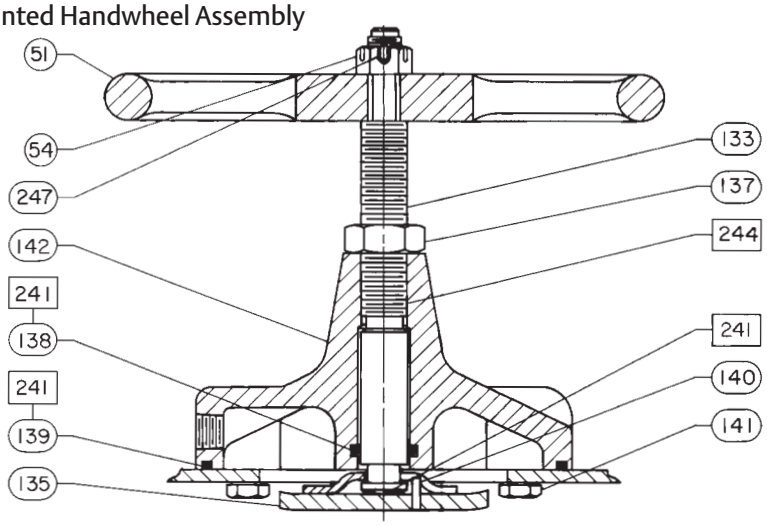
Parts List

Note
Part numbers are shown for recommended spares only. For part numbers not shown, contact your Emerson Process Management sales office.

Actuator

Key	Description	Part Number
1	Diaphragm Casing, zn pl steel	
3*	Diaphragm, nitrile	26A4668X012
4	Diaphragm Plate, aluminum	
5	Cap Screw, pl steel (12 req'd)	
6	Hex Nut, pl steel (12 req'd)	
8	Adjustable Travel Stop, pl steel (2 req'd)	
9	Cap Screw, pl steel	
10	Diaphragm Rod/bearing assembly, pl steel	
11	Spring, steel	
13	Spring Seat, cast iron	
18	Cap Screw, pl steel	
20	Housing, cast iron	
22	Mounting Yoke, steel	
23	Cap Screw, pl steel (4 req'd)	
27	Clamped Lever, steel	
28	Cap screw, zn pl steel	
29	Hub	
30	Retaining Ring, pl steel	
31	Bushing (2 req'd)	
35	Travel Indicator Scale, stainless steel	
36	Self Tapping Screw, pl steel (2 req'd)	
36	Cap Screw, zn pl steel (for use w/GO™ switch only) (2 req'd)	
36	Cap Screw (2 req'd) (for use w/Type 304 switch)	
37	Travel Indicator, stainless steel	
37	Travel Indicator (for use w/Type 304 switch)	
38	Machine Screw, pl steel (2 req'd)	
38	Cap Screw, pl carbon steel (2 req'd) (for use w/GO switch only)	
38	Cap Screw (2 req'd) (for use w/Type 304 switch)	
39	Cover Plate, plastic (used w/o positioner)	
40	Machine Screw, pl steel (4 req'd) W/o positioner	
41	Nameplate, stainless steel	
42	Drive Screw, stainless steel (4 req'd)	
55	Type Y602-12 vent plastic	
55	Vent Screen, stainless steel (for use w/GO switches only)	
56	Warning Plate, sticker	
71	Thrust Washer, alloy steel	
74	Adjusting Screw, cast iron	
76	Lithium Grease	
77	Medium Strength Thread Locking Adhesive	
79	Washer, steel	
80	Floater, 416 stainless steel	
86	Hex Nut, zn pl steel (2 req'd)	
121	Screw, Self Tap (2 req'd) 12.7 mm (1/2 inch) shaft (w/o switches only)	

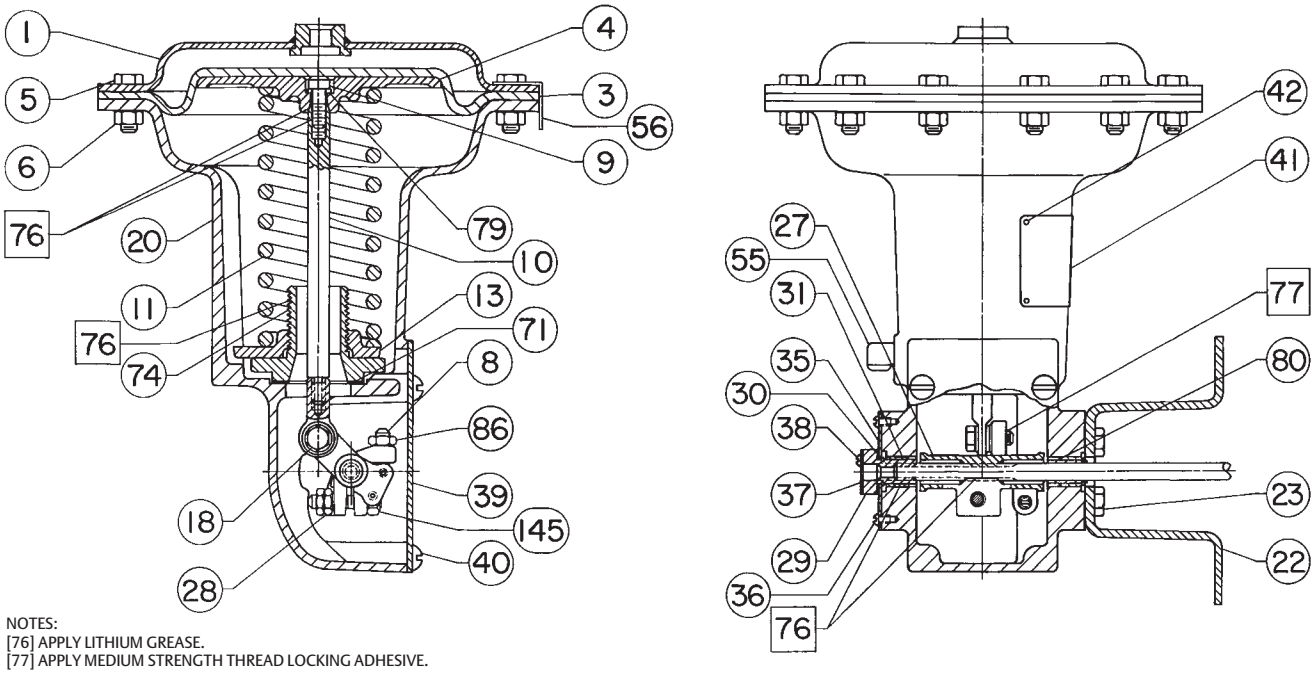
Figure 4. Fisher Top-Mounted Handwheel Assembly



☐ APPLY LITHIUM GREASE TO 241, ANTI-SEIZE LUBRICANT TO 244.

*Recommended spare parts

Figure 5. Fisher 1052 Size 20 With F and G Mounting



NOTES:
[76] APPLY LITHIUM GREASE.
[77] APPLY MEDIUM STRENGTH THREAD LOCKING ADHESIVE.

46A4683-F

Top-Mounted Handwheel

Key	Description	Part Number
51	Handwheel, cast iron	
54	Hex Nut, pl steel	
133	Stem, bronze	
137	Hex Nut, pl steel	
138*	O-Ring, nitrile	1D237506992
139*	O-Ring, nitrile	1D267306992
140	Groove Pin, steel	
141	Cap Screw, pl steel (6 req'd)	
142	Handwheel Body, cast iron	
241	Lithium Grease	
244	Anti-Seize Lubricant	
247	Cotter Pin stainless steel	

*Recommended spare parts

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